

## Abstract

### Method of Determining Structural Data of Prototypes for a Lightweight Technical Structure, Practice of the Method and Prototype Produced by the

#### 5 Method.

It has been known for constructing lightweight technical structures initially to fabricate a prototype and thereafter to optimize it. To do so, either a physical model is produced the data of which are copied and anchored in a numeric 10 prototype, or a numeric prototype is produced directly by means of structural considerations and methods. In either case, the gathering of data for the prototype is complex and as a rule does not yield a result which can be optimized in a simple manner. The object of providing a method of efficiently obtaining data for designing a prototype which can be optimized in a simple 15 manner is accomplished in accordance with the invention by selecting shell architectures of natural bio-mineralized unicellular organisms in accordance with an aspect set very closely adapted to the lightweight structure to be produced and by directly copying their structural data. In this context, sub-groups may also be selected. Partial solutions found are combined, the data 20 are scaled to the prototype which is scaled in a simple step. Prototypes of a lightweight rim, a lightweight building material or a permeable lightweight shell can be produced by preselecting diatoms or radiolaria.